UTAH RENEWABLE ENERGY INITIATIVE FOCUS GROUP

DRAFT REPORT
SEPTEMBER 17, 2007

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FOR SUBMISSION TO THE GOVERNOR'S BLUE RIBBON ADVISORY COUNCIL ON CLIMATE CHANGE

OCTOBER 5, 2007

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EXECUTIVE SUMMARY & RECOMMENDATIONS

(to be supplied)

REI FOCUS GROUP DESCRIPTION

The Renewable Energy Initiative (REI) Focus Group Purpose

The Renewable Energy Initiative (REI) Focus Group was organized in late June 2007, to develop detailed public policy actions that can be taken by state government and other leaders to increase the development of cost effective renewable electrical energy resources.

REI Focus Group Membership

The group consisted of representatives from a wide range of stakeholder groups, including state environmental, energy, and regulatory agencies; public and investor owned utilities; environmental organizations; renewable energy developers; financial and legal firms; academic organizations; and other interested parties. Meetings were open to the public, so attendance varied from meeting to meeting. See Appendix 1 for a list of participants, based on signed attendance lists from the various REI group meetings.

REI Focus Group Work Schedule and Study Scope

The group first met on July 9, 2007, and was tasked to submit its report to the Governor's Blue Ribbon Advisory Committee on Climate Change (BRAC) before October 10, 2007. Due to the time constraints, the group met every week during the period of July 9 – October 3, 2007, and confined its discussion to the area of renewable electricity generation resources. Additionally, the group mainly focused on ways to encourage development of those resources that would be large enough to help the state's electric suppliers meet the growing needs of their customers. The group chose this area because of the significant CO_2 emissions that result from the burning of coal and natural gas to generate Utah's electrical energy. If desired, one or more additional work groups could be convened at a later date to consider renewable energy resources for other sectors such as transportation and residential/commercial/industrial end use applications.

REI Focus Group Work Plan

The REI Focus Group utilized the following work plan:

- The group completed some exercises to identify high level economic, regulatory, and technology forces that encourage or discourage renewable resource development. From this work, the group identified reasons to develop renewable electrical energy resources, reasons why more renewable resources have not been developed, and an initial list of topics to consider.
- Presentations by subject matter experts and related discussions were then scheduled over the next four weeks to educate the group on the renewable energy

Comment [Gms1]: DPU: It seems there were other goals discussed, namely, energy diversity and energy security. As noted in the Division's comments on the strawman proposal submitted on 9/18/07, these two goals, if still relevant, need to be defined in terms of explicit goals and objectives. This would, in turn, inform the direction needed to achieve the selected targets.

Comment [Gms2]: UREA: While it may have been stated, I don't know that our representatives felt the purpose was to "*develop detailed public policy actions that can be taken by state government*" The Energy Advisor to the Governor was specific to say that the assignment was not to develop a RPS, but that after its work a RPS could be possibly be a recommendation coming from the REI group.

From my notes of the first meeting I believe the statement was made that there were three objectives; the reduction of green house gases, diversity and security. Perhaps that should be reflected in the group purpose, as well as a summary of how the groups work met or did not meet the stated objectives.

Comment [Gms3]: UREA: While the group may have chosen to look at ways to encourage development of resources "*large enough to help the state's electric suppliers meet the growing needs of their customers.*" Hopefully the group understands the reality that renewable options cannot, with present technology, make a major difference in meeting needs of the citizens living in Utah. Rocky Mountain Power estimates a shortfall of over 3000 megawatts in less than ten years. The current statement in the draft may give a false sense of security about what renewable energy can do to meet the growing energy demand in Utah.

Comment [Gms4]: UCE: The governor charged this group to focus on renewable energy development; this paragraph should follow the minutes from the first meeting on July 9th and Dianne Nielson's presentation to the group; recommend deletion.

Comment [Gms5]: UCE: From this work, the group identified benefits of renewable electrical energy resources, barriers to renewable resource development, and an initial list of policy options to consider.

resource marketplace and technologies, various policy options, and related utility regulatory and cost recovery issues. See Appendix 2 for a list of the topics covered in this phase.

- Two subgroups were assigned to consider the definition of renewable energy resources and the definition of cost effectiveness, respectively. Summaries of the subgroup discussions are provided in Appendix 3.
- The group then developed an expanded list of state-level issues, programs and policies affecting renewable energy resource development.
- From the expanded list, three initiative areas were selected that the group felt ~~that it~~ should be discussed in more depth and for which it should develop recommendations to be forwarded to the BRAC for consideration in advance of the 2008 legislative session. They included:
  - Renewable ~~portfolio~~ Portfolio ~~standard~~ Standard (RPS) design considerations and whether there is a need for a Utah RPS
  - Discussion of various credits and incentives that could encourage renewable resource development
  - Actions ~~that could~~to encourage the transmission and distribution system to be strengthened to support renewable resources
- REI Focus Group participants ~~also~~ were asked to submit additional ideas, comments, suggestions and supporting information for consideration. Input ~~that was~~ received was either incorporated into the group findings and recommendations or is provided in Appendix 4.
- This written report was prepared for submission to the BRAC.

Comment [Gms6]: DPU: The Division made several comments on the "definition" and "eligibility" of renewable resources in comments submitted. In general, Utah code appears to be a good starting point, and the Division recommends a broad-based policy here. However, the definition of renewable energy needs to be finalized. The Division's suggestions on this issue can be found in its comments on the strawman proposal. It is understood that some smaller municipals or co-ops may already produce a large amount of renewable power (depending on definition) as a percent of net generation. This issue should be discussed in greater detail.

Comment [Gms7]: UCE: From the expanded list, the group focused their initial discussions on broad consideration of the following three initiatives

Comment [Gms8]: UCE:
•Renewable Portfolio Standard (RPS)
•Incentives for renewable resource development

REI FOCUS GROUP RESULTS

The following paragraphs summarize the results of the REI Focus Group discussions.

Reasons to Develop Renewable Electrical Energy Resources

The following reasons were identified for developing more renewable electrical energy resources to supply Utah's electrical energy needs:

- Diversify Utah's electric generation resource portfolio, which is currently fueled primarily by coal and natural gas. Diversification could mitigate the impact of future increases and volatility of fossil fuel prices, and improve energy independence and security.
- Improve air quality by avoiding some future fossil-fired power plant emissions.
- Reduce or avoid generating additional CO_2 emissions, a major greenhouse gas contributing to climate change; and
- Encourage rural economic development, including the direct economic benefits associated with development of a new renewables projects in rural communities, as well as the direct benefit to the renewables energy industry, and the indirect benefits associated with Utah having a high quality environment, stable electric prices, and plentiful electric resources.

Why Haven't More Renewable Resources Been Developed?

The REI Focus Group identified the following factors that have slowed the development of large amounts of renewable electrical energy resources:

- Renewables are often considered to expensive or risky: When renewable resources are analyzed using traditional electric utility cost analysis methods, they often are evaluated as being higher cost and/or higher risk than other generation technologies. This is due to their relatively low economies of scale, high capital cost, the low generating capacity factors of some renewable technologies, increased development risks of geothermal field exploration, and technological/market maturity of some technologies. Proponents of renewable resources argue that renewables actually would be cost competitive if all of the costs of fossil fueled generation (e.g. emissions, CO2, waste products, etc.) were recognized by the state and valued within utility commission regulations. Examples include attributing costs to electricity customers derived from the adverse effects of emitting greenhouse gases, air pollution, mining and drilling, etc. However, not all parties agree that such costs should be considered in setting utility rates. Such costs, sometimes called environmental externalities, are often difficult to quantify, and consistent methods to include or consider these costs in utility rates have either not been developed or have seen limited use during utility planning and resource procurement.
- Another factor is that there are arguably (not all parties agree) modeling problems within the current utility planning system that do not properly assess what the

Comment [Gms9]: UCE: **Benefits to Developing Renewable Electrical Energy Resources**

Comment [Gms10]: Emmi: Add:

•Reduce line loss and add to peak generating capacity by encouraging renewable energy installations such as photovoltaic panels in urban settings.
•Participate in Western regional renewable resources development, marketing and technological innovation.
•Aid in the promotion of the North American West as a region with superior comparative advantages in renewable resource development and technology.

Comment [Gms11]: DPU: Its not clear what security means – less exposure to market prices for natural gas and coal? Or does it mean something else?

Comment [Gms12]: Powlick:
•Diversify Utah's electric generation resource portfolio, which is currently fueled primarily by coal and natural gas.
•Stabilize electricity prices due to fossil fuel powered systems' vulnerablity to volatile fuel prices and most renewables' lack of need for fuel.
•Improve air quality by displacing future fossil-fired power plant emissions.

Comment [Gms13]: UREA: I suggest placing a period at the end of emissions and deleting the words "*a major greenhouse gas contributing* ... [1]

Comment [Gms14]: UCE:
•Diversify Utah's electric generation resource portfolio, which is curren ... [2]

Comment [Gms16]: UCE: Barriers to Renewable Energy Development

Comment [Gms15]: CCS: NOTE: The rural economic development should be carefully considered, because if ... [3]

Comment [Gms17]: Emmi: Add:

•Current methods of analyzing ele ... [4]

Comment [Gms18]: Powlick

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Comment [Gms19]: Powlick

Comment [Gms20]: DPU: Note that the Division strawman comments also discuss this issue. Currently, unde ... [5]

Comment [Gms21]: Powlick: recommend deletion

Comment [Gms22]: UAE: Also, if regulators are going to expand the discussion of externalities that dis ... [6]

Comment [Gms23]: Powlick: recommend deletion actual level of cost effective renewables would be within their overall portfolio (even without trying to monetize the value of externalities.)

- Obstacles to implementing residential and business solar PV systems include (1) lack of public knowledge about the advantages of solar PV systems and available incentives (2) lack of vendors and qualified installers for small PV systems and (3) some regulatory barriers.
- Some renewables are intermittent generators: Geographic regions that hold the highest potential for renewable resource development often are located many miles from major population centers, and frequently are not located near transmission lines that could carry the renewable power to markets. Transmission lines and associated electrical infrastructure are costly to build and usually take many years to design, obtain rights of way and permits, and construct.
- Some renewables are intermittent generators: Some renewable resources cannot be dispatched or scheduled to meet the system's demand for power, but instead must be backed up by other generators when not available. Referred to as "intermittent resources", examples include wind and solar technologies. This means that additional fossil fired generators or other infrastructure must be developed to ensure that the utility can meet customer demands when the renewable resources are not available, and that system frequency, voltage, and grid reliability standards are met.
- Development costs and risks: Most forms of renewable energy entail high development and capital costs and very low operating costs. Geothermal development is especially costly, even though successful projects are very cost-competitive. Wind projects typically take many years to recoup high capital costs. Absent proof of excellent resources, these developments are often seen as too risky by investors.
- High end-user costs: Distributed renewable generating systems often present daunting economics to the prospective owner/user of the system. Absent a valuation of the public benefits of such systems and resultant public or utility support, payback periods may be unacceptably long for most prospective buyers of such systems.

State Policies and Programs Affecting Renewable Energy Resource Development

The REI Focus Group identified the following economic and regulatory conditions, policies or programs which influence how much renewable electrical energy resources will be developed:

- Whether a (public or investor owned electric) utility can achieve full and timely recovery of renewable energy resource and related infrastructure costs without creating unacceptable price increases to its customers.
- How much additional or replacement generation resources a utility needs to serve its customers, and the time frame in which new resources are needed.

Comment [Gms24]: Andy S.

Comment [Gms25]: DPU: This is an issue that the State Energy Program representatives discussed in the 9/20/07 REI meeting. The presentation findings should be incorporated into the document. It would be beneficial to highlight the differences between those in-state resources that are technically feasible and those that are economically feasible. A discussion of "all-in" costs of making these resources available would be instructive.

Comment [Gms26]: CCS: This section is somewhat misleading. Intermittent resources don't need direct back up, but rather require that the overall system is developed properly to account for them. There is likely an absolute limit to the percentage of intermittent that can be added to the system, but the limit is also likely to be high enough that it isn't material to this discussion.

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Comment [Gms27]: UCE:
•Traditional electric utility cost analysis methods often evaluate renewable resources as being higher cost (with the exception of some wind and geothermal resources) and as compared to traditional electricity generation technologies. This is due to the low generating capacity factors of some renewable resources, increased development risks of geothermal field exploration, and limited technological/market maturity of some technologies.
•Traditional electric utility cost analysis models do not take into consideration external costs, such as impacts on air quality, public health, water consumption, effects of emitting greenhouse gases, and land use impacts, among others. Furthermore the risk mitigation benefits of renewables are difficult to quantify using traditional utility cost analyses.
•Renewable energy resources have high upfront capital costs and no fuel costs, making project financing more dif ... [7]

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Comment [Gms28]: Powlick: The original title to this section is a misnomer.

Comment [Gms29]: DPU: I know utilities are concerned about this, but there are procedures already in place for a utility to recover its prudently incurred costs: SB 26, rate cases, etc.

Comment [Gms30]: UREA: Perhaps it should be noted that there is no question about who pays for the costs of any expense at a rural electric cooperative – the members (ratepayers) of the co-op. Unfortunately the group has not had ample time to address costs and de ... [8]

- Whether conservation, load shaping, demand side management, or other measures are economically and operationally more attractive to a utility than adding new resources.
- Whether equipment availability and prices are such that utilities can acquire sufficient quantities of renewable resources (in the form of assets or market purchases) at reasonable cost in time to meet their obligations to serve customers.
- Whether policy mandates create supply restrictions or distorted prices reflecting supply pressures, or whether adequate supply exists for liquidity in the market.
- Whether a legislative mandate or other requirement exists in which an electric provider is committed to achieve a certain percentage of renewable electrical resources in its total delivered energy to its retail customers. This is often accomplished by a renewable portfolio standard (RPS), a broader clean energy portfolio standard, or through enforceable renewable resource commitments. included in a utility's integrated resource plan approved by state utility regulators.
- Whether a package of streamlined site study and selection processes, permitting, tax and other economic incentives exist that will facilitate the development of renewable energy projects in a specific location in an efficient and timely manner. This might be accomplished through the creation of renewable energy economic development zones, similar in concept to economic development zones that have been created to encourage commercial and industrial development in many Utah locations.
- Whether prices and metering policies exist that are attractive to independent renewable resource developers, including net metering to allow the energy output from renewable projects to be sold to the host utility
- Net metering policies for distributed renewables.
- The existence of public benefit charge funds, which are state-controlled funds generated by levying a small surcharge on consumer electricity usage (or from general funds). The fund is placed under control of a fund administrator who uses the money to support a range of end-use energy programs, which could include funding of renewable energy research and development projects and programs.
- The existence of green power purchasing and marketing programs, giving customers the choice of purchasing electricity from renewable sources or of paying into a fund that the utility will use develop renewable generation resources.
- The removal of transmission and other infrastructure barriers that discourage the development of renewable electrical energy resources
- The degree to which the transmission and distribution system is modernized and strengthened to support large or distributed renewable electrical resources. Technical considerations include transmission capacity, system control and stability issues, and ease of interconnection between suppliers and the transmission system.
- Government approved or provided incentive programs. Tax credits can spur development, as can utility rebate or buy-down programs. State grants, such as those provided for economic development projects, can also boost development.

Comment [Gms31]: Powlick: Redundant; ecommend deletion

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Comment [Gms32]: CCS

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Comment [Gms33]: CCS

Comment [Gms34]: Powlick: We are too small to really effect any significant changes through R&D. States the size of CA and NY can do this but I doubt that we can.

Comment [Gms35]: Powlick: Redundant; recommend deletion

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DESIGN AND NEED FOR A UTAH RENEWABLE PORTFOLIO STANDARD

As was reported in the Climate Change Stakeholder Working Group report to the BRAC, a ~~renewable~~ Renewable ~~portfolio~~ Portfolio ~~standard~~ Standard (RPS) is a requirement that utilities must supply a ~~certain~~ fixed percentage of electricity sold to the utility's customers from an eligible renewable energy source. Currently 23 states and the District of Columbia have adopted Renewable Portfolio Standards, with Illinois considering RPS legislation ~~is~~ in their current legislative sessions.

The REI Focus Group decided it was necessary to study potential design features of an RPS before considering whether Utah should adopt an RPS. In order to use limited meeting time efficiently, the focus group asked Kyle Davis of PacifiCorp to present a case study of the Oregon RPS legislation and the process that was used in Oregon to develop their RPS. Mr. Davis also provided a set of 17 questions to address when considering an RPS, which were initially presented during testimony offered by Brent E. Gale, Sr. Vice President, Regulation and Legislation, MidAmerican Energy Holdings Company to the Utah Legislature's Public Utilities and Technology (PUT) Interim Committee on June 20, 2007. This approach helped the REI Focus Group to identify key design issues for possible inclusion in a Utah RPS, while also taking into consideration the important differences between Utah and Oregon's needs. See Appendix 5 for a list of the 17 questions and the Oregon RPS case study.

Staff from Rocky Mountain Power/PacifiCorp asked whether the goal of the group should be to establish a clean energy or low carbon portfolio standard, or if the goal should be to focus exclusively on renewables. They suggested such a goal would be more appropriate, especially since existing RPS states have now turned their focus to CO_2 reductions.

During the RPS discussion, representatives of public power entities such as municipal power and electric co-ops advised the focus group that ~~any~~ a mandatory Utah RPS ~~applicable to them~~ may present governance problems for them, especially related to any enforcement or oversight provisions. On the other hand, Rocky Mountain Power expressed concern that there should be equitable treatment of all electricity customers under an RPS, and that all of the population should share the cost of enacting the new state policy.

In general, the REI focus group concluded that any Utah RPS must be carefully designed, with the right balance of features, in order to be of value. While the REI focus group was able to identify ~~the~~ some features that probably should be included, it was not possible to complete the balancing of the various features in the few weeks available to the group. In comparison, the development and balancing effort in Oregon took over a year of intense work by many stakeholders and policy makers. Even after the year of work, some decisions were decided by the Governor or during the political process in the legislature.

Comment [Gms36]: DPU: Also refer to the Division's comments on the strawman submitted 9/18/07.

Comment [Gms37]: CCS: NOTE: in order to present a true picture of the process it should be made clear that the group did not study any examples other than Oregon.

Comment [Gms38]: UREA: Perhaps I missed the meeting where the voluntary programs were reviewed, if so there should be some reference to the voluntary program. If it was not reviewed, it should be noted that the group desired to review voluntary programs, but did not have the time to do so.

Comment [Gms39]: UCE, Probst: The Governor's focus for this group was on renewable energy. A low carbon strategy is beyond the focus of this group and is encompassed in a number of the BRAC strategy options; recommend deletion.

Comment [Gms40]: UCE: There are a number of factors to consider in the development of an RPS, such as the diverse needs of Utah's rural electric cooperatives, municipal power providers, and the investor-owned utilities and customers. For example, if not handled properly, an RPS may present governance problems for public power entities and rural electric co-ops. On the other hand, there was concern over the equitable treatment of all electricity customers under an RPS, and that all of the population should share the cost and benefits of enacting the new state policy.

Comment [Gms41]: DPU: This an issue that should be addressed. The Division's comments on the strawman contain several remarks about the need for more clarity of goals, the need for additional data or information, etc.

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During the REI's RPS discussion, Utah Division of Air Quality staff prepared a "straw man" document that listed the various RPS design features from the Oregon model, which the REI focus group then used to guide its discussion. The following section describes the design features that were considered by the REI focus group and comments concerning ~~the feature~~those features. Any quantitative targets listed in the following section are considered very preliminary or placeholders. The REI Focus Group concluded that specific final targets must be set after careful analysis and through the interaction of many stakeholders during the shaping of actual legislation. It is expected that Utah policy makers will establish a process to develop final RPS legislation, if Utah policy makers decide that an RPS is necessary.

Comment [Gms42]: UCE: Recommend deletion.

Utah Division of Air Quality's RPS Design Features for Utah

Comment [Gms43]: UCE:

Please see UCE comments in Appendix

(modeled after the Oregon RPS)

Comment [Gms44]: UCE: Recommend deletion

a) Preliminary Target:

Investor Owned Utility (IOUs):	20% by 2020
Municipalities:	5-10% by 2020
Rural Electric Co-ops:	5-10% by 2020

Targets for Municipalities and Co-ops that currently have a surplus in energy will not be applicable unless new resources are acquired.

Comment [Gms45]: UAMPS, UREA: On page 9 of 33 in the discussion of annexation of territory by co-ops and public power which would trigger an IOU RPS target. We object to including that provision. Utah law as determined by a number of court cases and provisions in the State constitution are very specific on municipal annexation regarding utility services. This suggested provision is counter to the current process and practice for annexation and would complicate the matter greatly. Before a municipality may take over a utility service from an incumbent provider, mutually agreed value must be paid. An RPS incremental requirement is not necessary.

Annexing of IOU service territory by Municipalities or Co-ops without consent, will trigger full (IOU) RPS targets.

Comment [Gms46]: Emmi: Add: "to be meet within five years of the annexation date for that portion of generating portfolio thus annexed."

Comments: Representatives of public power entities have stated in the REI meetings that a Utah RPS applicable to them may present governance concerns, especially related to any enforcement or oversight provisions. Legal research needs to be completed to determine if and why this is the case.

*[**Note:** Current status, as of 9/16/07. This paragraph will be updated to reflect any further target discussions in our remaining meetings:]* REI group participants did not arrive at a consensus renewables target during the first discussions of this topic. Instead of spending considerable time trying to arrive at a consensus, the focus group deferred discussion until other terms and conditions of an overall initiative were discussed. Utilities representatives objected to the goals as outlined and indicated that they could not commit until they had seen the remaining terms and conditions. On the other hand, other participants verbally stated that the targets were not ambitious enough. Target values must be set very carefully~~, with Target values must be set very carefully~~, with detailed analysis and system modeling of the Utah specific situation on a utility-by-utility basis, due to greatly varying resource addition forecasts for the various utilities, and the lack of reliable modeling results related to the stability of the western United States' electric grid under scenarios of greatly increased amounts of distributed and non-

Comment [Gms47]: UAE: This should be emphasized further. Without a complete Utah specific study it is impossible to know how much an RPS would cost ratepayers or how much renewable energy can be "economically" deployed. It would be irrational to recommend an RPS target without a detailed analysis.

dispatch-able renewable resources. For example, Rocky Mountain Power is in the process of adding considerable new generation resources, and has committed to add wind and geothermal resources as part of the commitments that Mid American Energy Holdings Company made as part of its acquisition of PacifiCorp. On the other hand, some municipal and other public power entities do not expect to add generating resources for at least several years, and are small enough that it may be impossible for them to add renewables without also adding expensive gas-fired peaking generation that would operate when the renewables were not available. Renewable targets also must be selected in a manner that is consistent with Utah's eventual CO_2 reduction targets under the Western Climate Initiative. Additionally, targets and interim milestones should be established and approved at the final resource planning point for a given year, and consideration should be given to use of three or five year rolling averages for establishing actual compliance.

In addition to the above considerations, some participants strongly recommended that the selection of the renewables targets be established after the definition of qualifying renewables is finalized.

b) Definitions of Renewable Energy Resource

As a minimum, renewable energy resources should be defined in accordance with existing Utah statute, to include biomass energy; certain qualifying hydroelectric energy, geothermal energy, solar energy, and wind energy. In addition, any RPS legislation should allow for other resources to be defined as renewables by a state wide governing body such as the Public Service Commission, State Energy Program, or ~~Division~~ Department of Environmental Quality.

Biomass energy means any of the following that is used as the primary source of energy to produce fuel or electricity:

- material from a plant or tree; or
- other organic matter that is available on a renewable basis, including:
  - slash and brush from forests and woodlands;
  - animal waste
  - methane produced at landfills or as a byproduct of the treatment of wastewater residuals;
- aquatic plants; and
- agricultural products.

Biomass energy does not include

- black liquor
- treated woods; or
- biomass from municipal solid waste other than methane produced at landfills or as a byproduct of the treatment of wastewater residuals.

Comment [Gms48]: Powlick: Recommend deletion.

Comment [Gms49]: Powlick: More detail than is really needed; also partially addressed later.

Comment [Gms50]: CCS: CCS objects to these targets being established in the absence of any quantitative analysis. This discussion does not reflect our concerns that without knowing what levels of renewable resources are cost effective and without studying the technical possibility of achieving these goals as well as the associated costs, this group is doing a grave disservice to policymakers by promoting policy without adequately identifying the potential consequences.

Comment [Gms51]: DPU: And other components of the RPS are finalized. For example, what REC trading or restrictions are adopted.

Comment [Gms52]: Emmi: Add:

- up to 30% of each year's target may be met with all of the following:
  - Demonstrable results from demand-side management programs
  - Verified improvements in utility plant efficiency
  - On-site renewable energy installations in homes and businesses

Comment [Gms53]: Powlick: More detail than is really needed; also partially addressed later.

Comment [Gms54]: UAMPS, UREA: Under definitions of renewable resources on page 10 of 33, we renew our objection to the use of "qualified hydroelectric energy". The current state law provides that hydroelectric is defined as a renewable resource. There is no qualifier included in the definition.

Comment [Gms55]: UAE believes that hydro electric resources should be included in our recommendation. However, as a group we need to decide whether hydro should be qualified or not, prior to including the resource in our recommended definition of renewable energy.

Comment [Gms56]: Probst: Include inter alia plant or seed oils or biodiesel to the extent of plant or seed oil inputs. These are very suitable for stationary electric sources as well as mobile use and are clearly renewable.

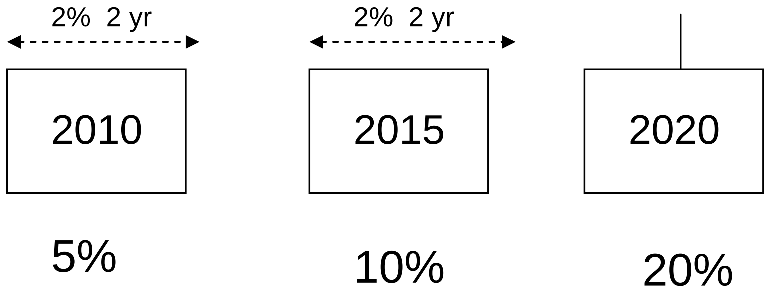
Comment [Gms57]: Emmi: Add:

- Timber deadfall and windfall that will otherwise add to carbon sequestration in forest and woodland soils.

Comments: Some participants argued that the list of qualifying resources should be expanded to include other low-carbon emitting, and otherwise environmentally low-impact resources such as demand side management, improved plant efficiency, combined heat and power, and other actions that avoid the use of non renewable resources such as fossil fuels. These types of resources could be just as effective in helping Utah achieve its CO_2 emission reduction and other targets as the resources that presently qualify as renewables. Some states have sought to tap this potential resource by setting a percentage target for energy efficiency or other measures as part of their RPS legislation or rule making.

c) Compliance

Beginning in calendar year 2010, investor owned utilities would be required to reach the following milestones:



There would be a 2% 2 yr window for 2010 and 2015 milestones to prevent artificial markets; however 2020 would be a hard target.

Municipalities and Co-ops do not have intermediate milestones.

Compliance will be met and verified on the basis of Renewable Energy Certificates.

Comments: Several participants indicated that it is very important to have flexibility in meeting the compliance targets, due to uncontrollable events such as weather, equipment availability, natural disasters, market conditions, or utility system loads. Targets and interim milestones should be established and approved during the final resource planning process for a given year, and consideration should be given to use of three or five year rolling averages to verify actual compliance. Also, cost caps (see (i) below) can be used to help protect against the costs of unanticipated events.

d) Renewable Energy Certificates

In order to demonstrate compliance with the RPS requirements, an electric utility must provide proof of having obtained or produced the qualifying electricity and having delivered it to its customers. This proof is accomplished through the

Comment [Gms58]: UAE

Comment [Gms59]: UAE, Powlick: This sentence is unclear and needs to be clarified. "2% 2 year window" is vague.

Comment [Gms60]: Probst: 2% window is a needless goal and should be eliminated; 2015 goal should be a hard target; the artificial markets comment should not be included.

Comment [Gms61]: CCS: It is arbitrary to adopt these targets without any study of when renewables might actually be able to come online. If any significant transmission is necessary to support the development, the 2015 milestone could be wildly uneconomic. It would be better to development milestones based on development projections to provide incentives to keep the process moving, rather than instituting milestones without knowing or considering the consequences.

Comment [Gms62]: Powlick

Comment [Gms63]: CCS: Adopting the bundled/unbundled REC concept from the Oregon legislation is a perfect reason why other states should have been studied. This is a complex, and not fully formed idea that has little demonstrated merit. Why would Utah adopt that portion of another state's legislation?

Comment [Gms64]: DPU: Does this sentence contradict the idea of an unbundled REC? Maybe: In order to demonstrate compliance with the RPS requirements, an electric utility must provide proof of having obtained **or produced the qualifying electricity or its environmental attributes.**

creation of a market tracking mechanism that follows the creation, market transactions, and eventual retirement of renewable energy units using Renewable Energy Certificates (RECs). RECs serve much the same functions as commodity futures contracts that are bought and sold between parties without the underlying actual quantities of the commodity being physically moved between buyer and seller until the final delivery. Bundled RECs are RECs that are always bought or sold along with the energy itself that has been produced by a renewable generation resource, from the point of creation to the point of final consumption. Unbundled RECs are RECs that have been administratively separated from and bought and sold independently of the actual energy. Electric utilities are allowed to use both bundled and unbundled RECs within the Western Electricity Coordinating Council (WECC).

Comment [Gms65]: DPU: This definition may be acceptable if everyone that reads the report is familiar with the idea of a REC. if we anticipate that some reading the report may be clueless, a stronger definition may be warranted.

If a utility purchases a bundled REC, the electrical energy associated that bundled REC must also be delivered to the utility. But in the case of an unbundled REC, the actual electric energy from a renewable resource can be "swapped out" for non-qualifying electricity (e.g., from natural gas or coal) as it makes its way to the final destination, with the utility's total purchased and retired RECs demonstrating that the right amount of renewable energy was produced to meet the utility's RPS requirement. By allowing for the use of unbundled RECs, utilities can gain the flexibility of using non-qualifying electricity to "shape" or "firm" wind power and other intermittent power resources, as long as the total ~~amount~~ number of RECs that are purchased and retired by the utility equal the renewable energy percentage of total electrical energy sales specified by the RPS.

For IOU's, the Oregon RPS requires that no more than 20 percent of their compliance in a given year may be met through the use of unbundled RECs. For the Municipalities and Co-ops, no more than 50 percent of their compliance in a given year may be met through the use of unbundled RECs.

e) Issuance of Certificates

A statewide governing body will issue RECs and the tracking will be done by Western Renewable Energy Generation Information System (WREGIS).

Comment [Gms66]: UAE: We need to address the wording of this statement. It is really a technical issue. Some people brought up that a state-wide governing body probably cannot issue the RECs. UAE suggests we talk with someone from WREGIS to make sure the issuing of RECs is done in the best way possible.

Comments: Some participants asked if a statewide governing body should oversee the certification of RECs using standards and tracking provided by WREGIS.

f) Existing Facilities

An existing facility is defined as those that became operational before January 1, 1995.

Comments: This issue needs to be addressed as targets are developed.

Comment [Gms67]: CCS: Again, it makes no sense why this deadline is used. Oregon chose this date because it was politically expedient and had the effect of allowing certain hydro resources and not others. It also has the effect of not counting Blundell, a geothermal unit located in Utah. Why would Utah include an Oregon provision with such a detrimental impact on an early renewable resource located in the state?

g) Renewable Energy Certificate Trading

Electric utilities can use both bundled and unbundled RECs within the Western Electricity Coordinating Council (WECC). RECs may only be used once and only by the owner of the REC.

Comments: It is important to establish a system that will ensure against double counting. At the same time, depending on the nature and timing of targets, there may be opportunities to sell RECs to help provide cost effective development of renewable energy resources.

Targets would only apply to kilowatt-hours sold within Utah.

The group discussed the incentives that could be created for in-state renewable energy development if utilities were allowed to use unlimited amounts of RECS produced by in-state projects, with some restrictions placed on amounts of out-of-state RECS. But some participants argued that the narrower the geographic restrictions placed on utility procurement practices, the more expensive the projects will tend to be, and the more cost will be passed on to the consumer.

h) Recovery of Costs

All prudently incurred costs associated with complying with the RPS are recoverable.

Comments: It is important to ensure that the rate setting process results in all elements of cost being balanced, and that costs and revenues are matched. PacifiCorp has already seen opposition and push-back on the costs it has incurred in its renewable resource development efforts. Part of the problem is that renewable energy resources are generally capital intensive in the early years of a project's useful life, and utilities must get revenue to recover the all-in costs of projects to match those costs in the years they are incurred. Cash flow is critical. Also, it should be noted that the tax credits that can make renewable resources more attractive in the marketplace cannot be used by electrical co-ops or municipal power entities.

i) Cost Caps

Utilities are not required to comply with the RPS to the extent that the sum of the incremental costs of compliance with the RPS, the costs of the unbundled RECs, and the alternative compliance payments made exceed four percent of a utility's annual revenue requirement in a compliance year. RPS compliance costs are not included in the annual revenue requirement to prevent a compounding effect.

Comments: The REI focus group discussed a few different ways of establishing a cost cap, such as a per-meter cost cap rather than a certain percentage of a utility's annual revenue requirement.

In further discussion, utility representatives emphasized that a cost cap should be applied during the annual resource operational planning stage, not used to

Comment [Gms68]: CCS: Statutes and regulatory processes already exist to give cost recovery for any and all prudently incurred costs. An RPS does not need to provide any new assurances, only reference existing ones.

Comment [Gms69]: UREA: As stated previously, in the rural electric cooperative model, all costs are borne by the members (ratepayers).

Comment [Gms70]: DPU: It still is not clear why renewables are different from other types of generation plants. I would like to have some more discussion on this point.

Comment [Gms71]: CCS: NOTE: CCS objects to the inclusion of this comment about "push back" unless it is further substantiated. The Committee's understanding is that the push-back received from the Company is a challenge to whether or not its development efforts were prudent. Prudency must always be part of the review for cost recovery. To suggest that push-back requires additional recovery guarantees would be misleading and could result in the unintended consequence of providing incentives for less stringent prudency review.

Comment [Gms72]: UCE: If this is the case, please provide specific examples of projects, date, who is "pushing back" etc.

Comment [Gms73]: Probst: This sentence should be stricken.

Comment [Gms74]: Powlick: Recommend deletion penalize the utility after the actual results were reported. This is because unusual weather, equipment problems, or other natural disasters may alter the most prudently made plans. On the other hand, utility representatives also explained that the 4% cost cap would not necessarily restrict a utility from getting cost recovery for prudent projects; if the utility decided that projects should be pursued above the 4% cap, they would be required to explain why they were prudent to the public service commission or other oversight body.

j) Alternative Compliance Payments

In lieu of procuring renewable energy resources, utilities can pay an Alternative Compliance Payment (ACP), to be placed in a fund that can only be used for acquiring renewable energy resources in the future, or for energy efficiency and conservation programs. Rates for each utility will be established on a per megawatt-hour (MWH) basis by the Utah Public Service Commission (PSC). This mechanism sets an effective cap on the cost of complying with the RPS.

Comments: A state agency would calculate the ACP value in dollars per megawatt-hour, not the utility. The ACP mechanism helps to ensure that price gouging does not occur during negotiations between developers or sellers and buyers. In the event that renewable project prices rise above the ACP value, the utility would be allowed to defer investments until the market corrected itself.

Alternative compliance might also be achieved through reduction in consumption of electricity through demand-side management measures and energy efficiency. A cap could be placed on the amount of such alternative compliance, however, this method would provide utilities with a means to reduction fossil fuel use and emissions if the cost of renewables becomes too high or projects are delayed. This would also provide an alternate compliance path for small public utilities for which adding renewable generation is not feasible.

k) Green Power Programs for All Utilities

Every utility in Utah must offer their customers the option of voluntarily purchasing renewable energy. These purchases will not count toward an RPS.

Comments: The green power programs allow customers to purchase renewable energy above and beyond the RPS compliance level. After some discussion, the group concluded that green power programs might be better addressed through rule making.

l) Miscellaneous

By Oct 1, 2008, the state must establish an automatic adjustment clause method that allows timely recovery of costs prudently incurred by an electric company to construct or otherwise acquire facilities that generate electricity from renewable energy sources and for associated electricity transmission.

Comment [Gms75]: CCS: Again, why the Oregon model? It has yet to be worked out how the 4% will be determined and what kind of unintended consequences accompany this policy. If we had examined other states' models, we could see some alternatives that have the potential to work better. For example, in Minnesota, the new legislation (passed earlier in 2007) requires that utilities receive a determination from the PUC to change their RPS levels if they can demonstrate that it isn't cost effective.

Comment [Gms76]: CCS: **It must be remembered that any compliance payments are being paid by consumers. Any program must be designed such that the consumers making the payments received the benefits from those payments, presumably through future resource development or other methods.**

Comment [Gms77]: Powlick

Comment [Gms78]: UREA: I believe I had indicated I felt these programs should be included, if one of the governor's goals was to decrease green house gases, and especially if a utility had developed a very successful program, they should receive credit in an RPS.

Comment [Gms79]: Green power programs might be better addressed through rule making but legislation should determine if these purchases can count towards an RPS – and the REI should make a recommendation. UAE does not support using green power purchases towards an RPS.

Comment [Gms80]: CCS: It would be better to ALLOW an automatic adjustment clause rather than to REQUIRE it. Utah is different than some other jurisdictions in its treatment of energy costs and revenues and it would be improper for this group to have an inadvertent and potentially significant impact on regulatory policy in developing an RPS. The development of this type of mechanism is more properly addressed in a filing before the PSC.

The RPS shall allow utilities to recover in the rates of all but the largest customers the costs of conservation measures.

Comment [Gms81]: CCS: Why all but the largest customers? This may have arisen from specific negotiations in Oregon, but without justification appears to be prejudicial treatment of certain customer classes and should not be the starting point for Utah legislation.

Utilities and Independent Generators must submit annual compliance reports to the PSC or governing state-wide body.

Comments: The miscellaneous issues listed in this section should possibly be addressed in the regulatory arena rather than in legislation. However, some participants expressed a preference for the issues to at least be addressed at some level within legislation, thus providing specific guidance to regulators. Research needs to be done on how plants such as Bonanza and Intermountain Power Project should be addressed, where significant amounts of power produced by those plants are delivered to customers outside Utah.

Rocky Mountain Power committed to provide a better description of what they hope to see developed regarding regulatory issues.

CREDITS AND INCENTIVES

Comment [Gms82]: Probst: REI needs to incorporate into the final report a set of recommended credits and incentives that can make Utah competitive with other states; solar in particular will need incentives comparable to Oregon's BETC.

The REI focus group discussed various tax credits and incentives on during their September 5, 2007 meeting. As the discussion progressed, it became apparent that a wide variety of different incentives or ~~credit schemes~~ tax credits can be implemented that would encourage the development of renewable energy resources, but that policy makers must first decide how much total money should be committed from Federal or state budgets. Once the total amounts to be made available are determined, specific tax credit and incentive programs can be designed within the budget in ways that will most effectively encourage renewable resource development and associated benefits to the state.

Comment [Gms83]: UCE, Probst: Recommend deletion.

Comment [Gms84]: UCE

The focus group also agreed that incentives or credits should be implemented for a continuous period of time that will be consistent with the planning horizon and implementation schedule of the renewable resources that must be built to comply with any RPS targets.

Potential Credits and Incentives

- Increased production tax credits for in-state renewable energy generators
- Expansion of production tax credits to cover concentrating solar.
- Increasing current caps on investment tax credit amounts ($2,000 for residential and $50,000 for commercial systems).
- Make current tax credits transferable
- Provide direct assistance to non-profits or local government agencies that cannot take advantage of tax credits
- Provide tax credits to companies for the development costs of large projects (esp. geothermal and wind)
- Provide "bonus" REC's to utilities for in-state renewable energy used

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Comment [Gms85]: Powlick

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TRANSMISSION AND DISTRIBUTION SYSTEM ACTIONS

In order to help the REI Focus Group to understand transmission and distribution system issues, Mr. Jim Tarpey of Holland and Hart gave a presentation on the Wyoming State Infrastructure Authority (WIA). See Appendix 7 for a summary of Mr. Tarpey's presentation.

Following Mr. Tarpey's presentation, the REI group discussed the following possible actions to help spur the development of transmission to serve renewable energy resource.

Establish a Utah infrastructure authority

Developing and delivering renewable electricity winds up being a "chicken and egg" issue because renewable development and transmission development are inextricably linked and interdependent on each other. One does not happen without the other, and yet financing and constructing one without the other is not quite possible without certain guarantees. The solution to this problem would be integrated transmission planning to REDZs as a part of a REDZ build-out plan. Constraints on new transmission development could be further alleviated if the state's utilities renewables purchases and resultant project development occurred on a timetable coordinated with transmission development so that both could occur simultaneously.

When asked about how Utah might consider setting up an infrastructure authority, ~~Jim~~ Mr. Tarpey suggested broad authority, a high level board appointed by the Governor, with a clear mission about whether the state is planning to be an import or and export state, the role of renewable energy resources, and whether the authority should be a state instrumentality with the associated separation from state government (which gives leverage and avoids the authority being seen as just another state agency).

Create Renewable Energy Development Zones.

The group discussed how to move from the tradition system of transmission planning to other ~~schemes~~ methods that could help smaller renewable projects to obtain transmission service. Several members of the REI focus group suggested that the existence of Renewable Energy Development Zones (REDZs) could be very helpful in helping utilities and other entities to plan and construct transmission lines, as well as simplify permitting and other issues related to development of the renewable resources themselves. Tim Wagner suggested that a full REDZ study committee should be recommended to Governor Huntsman. Carol Hunter suggested that one place to start would be to study the economic development statutes to learn what could be applied in establishing REDZs. One potential downfall with REDZ is that they create winners and

Comment [Gms86]: UCE: This is a complex strategy and a full REDZ study committee may be helpful. A first step may be to study the economic development statutes to learn what could be applied in establishing REDZs.

losers, in that they prioritize which areas will receive special treatment. Utah's renewable resources are distributed widely across the state.

Comment [Gms87]: Probst: This statement is partly misleading; this should be for the purpose of identifying priorities for building transmission.

Comment [Gms88]: UCE

In order to begin any renewable energy generation project, land leasing and permitting is required. All renewable technologies face permitting hurdles. While specific permitting hurdles vary by technology (i.e., wildlife impacts), multiple levels of jurisdiction (federal, state and local) and associated processes when leasing land for development, are both common problems. There is also a lack of established interagency coordination for leasing, environmental review (NEPA) and permitting. This barrier would be alleviated if state and federal agencies cooperated in a coordinated, streamlined and expedited NEPA environmental review and single, "master" environmental impact statement for each renewable resource zone as a whole. This would reduce the time and costs, as individual project proponents would not have to do independent review and environmental impact statements for each project proposed. Joint environmental documents should be created and consolidated state and federal permits within one year.

Comment [Gms89]: Powlick: This paragraph doesn't relate to this section of the report; recommend deletion.

Kyle Davis suggested that the renewable energy development zone (REDZ) concept could be of great help in solving the transmission problem. California only recently has established a transmission coordination agency.

Comment [Gms90]: Powlick; recommend deletion

Comment [Gms91]: UCE: Renewable energy development zone (REDZ) could help in solving the transmission problems.

Inadequate transmission infrastructure and siting delays and complications are two significant barriers to all new renewable energy development in Utah. Both of these hurdles could be alleviated with the establishment of renewable energy development zones (REDZs) in Utah. The state ~~should~~ could then establish streamlined, coordinated and expedited siting and transmission policies in REDZs. A REDZ is a geographic region that possesses a renewable resource[1] of significance. Colorado and Texas each passed laws in 2007 to spur in-state renewable development by requiring: 1) the designation of renewable resource zones, coupled with transmission development plans to access the energy in those zones, and 2) the build out of transmission to bring the electricity out from the renewable resource areas.

Comment [Gms92]: UCE: this would be defined in policy – not need to define here.

Rocky Mountain Power/PacifiCorp briefly mentioned developments occurring in California. The California Energy Commission (CEC),the California Public Utilities Commission (CPUC), California Independent System Operator (CaISO) and load-serving entities began in 2007 an initiative called the California Renewable Energy Transmission Initiative (CRETI). The CRETI will build upon the work of the Tehachapi Collaborative Study Group, and identify and assess renewable resource zones in the state and develop coordinated, cost-effective resource development plans that could provide sufficient renewable electricity to California consumers by 2020 to meet AB 32 targets. The work of the CRETI will take place over two years in three phases.

1) Statewide identification and assessment of competitive renewable energy zones.
2) Identification of priority REDZs and creation of conceptual transmission plans for these zones.

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[1] Meaning renewable fuels – wind, geothermal steam, solar radiation, and biomass fuels.

3) Development of Plans of Service (POS) for highest priority REDZs. These POS will provide detailed plans for transmission and infrastructure upgrades necessary to develop these zones but will not select specific transmission routes.

Remove or Reduce Current Transmission Development Hurdles

Developing and delivering renewable electricity winds up being a "chicken and egg" issue because renewable development and transmission development are inextricably linked and interdependent on each other. One does not happen without the other, and yet financing and constructing one without the other is not quite possible without certain guarantees. The solution to this problem would be integrated transmission planning to REDZs as a part of a REDZ build-out plan. Constraints on new transmission development could be further alleviated if the state's utilities renewables purchases and resultant project development occurred on a timetable coordinated with transmission development so that both could occur simultaneously.

Comment [Gms93]: UCE: There are other transmission policy options to advance renewables. Such as New mexico's RETA - Did the group decide that REDZ is the best option?

Comment [Gms94]: Powlick: Recommend deletion

Improve Transmission System Efficiency

One participant suggested that consideration be given to improving transmission efficiency as a way to realize capacity for the use of renewable resources.

Comment [Gms95]: UCE: Include write up on conditional firm, etc. Jim Byrne with West Wind Wires may be able to assist in this section.

Allow Cost Recovery for Transmission Development & Scoping Costs

It was also suggested that there must be assurance of cost recovery for the utility that will cover the development and initial scoping costs for transmission to serve renewable energy resources.

Comment [Gms96]: CCS: In considering cost recovery for new transmission, it is important to keep in mind that this is one more additional cost being borne by the same group paying for the renewable resources, namely ratepayers. All aspects of renewable development must be considered together in finding the most cost effective option. If transmission is developed in one forum and guaranteed recovery, and specific resources are developed in another forum and also guaranteed recovery, the end result could be much higher costs for consumers than an optimal plan would result in. **All discussions of cost recovery must include analysis of an impact on rates to consumers to ensure that the benefits are significant enough to justify whatever costs are incurred.**

California Renewable Energy Transmission Initiative

Rocky Mountain Power/PacifiCorp briefly mentioned developments occurring in California. The California Energy Commission (CEC),the California Public Utilities Commission (CPUC), California Independent System Operator (CaISO) and load-serving entities began in 2007 an initiative called the California Renewable Energy Transmission Initiative (CRETI). The CRETI will build upon the work of the Tehachapi Collaborative Study Group, and identify and assess renewable resource zones in the state and develop coordinated, cost-effective resource development plans that could provide sufficient renewable electricity to California consumers by 2020 to meet AB 32 targets. The work of the CRETI will take place over two years in three phases.

~~1)~~4) Statewide identification and assessment of competitive renewable energy zones.

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~~2)~~5) Identification of priority REDZs and creation of conceptual transmission plans for these zones.

~~3)~~6) Development of Plans of Service (POS) for highest priority REDZs. These POS will provide detailed plans for transmission and infrastructure upgrades necessary to develop these zones but will not select specific transmission routes.

Comment [Gms97]: Powlick: Recommend deletion

Comment [Gms98]: Powlick: Needs to be defined.

Develop a Smart Electrical Grid

In responding to questions about how to provide incentives for distributed renewable generation, Rocky Mountain Power/PacifiCorp replied that smart grid technology is the most likely enabler, since they would have a difficult time competing with the economics of utility-scale renewables. The group then discussed various considerations related to the smart grid, including:

Comment [Gms99]: UCE: Smart grid is not an incentive –worth discussion, but not as an incentive.

- The widespread deployment of low or no carbon distributed renewable generation resources, plug-in hybrid electric vehicles and end-use efficiency devices will require a “smart”, interactive grid and communication infrastructure.
- Today’s grid was designed to only transmit energy from source to the demand site and stands to benefit from the previous internet and computer boom and the current efforts in material sciences.
- A modernized grid would also improve operational security and allow increasing amounts of distributed renewable resources generated near load, which would reduce overall system losses and thus result in additional carbon savings.
- If plug-in hybrid electric vehicles become common place and solar distributed generation applications continue to increase, the energy grid must become more of a two-way operation where energy can be both delivered and received.
- Two-way flow of energy and data would also allow customers to respond to price signals to reduce usage at peak times, when the lowest efficiency fossil-fired units are operating.
- A range of technology exists today that can improve the grid such that reliability and efficiency is improved, and cleaner, distributed renewable energy resources are better integrated, including new smart meters, remote sensors, energy-management systems, better transmission lines, and advanced storage technologies that serve to optimize electricity generation, dissemination, and usage.

APPENDIX 1: REI FOCUS GROUP PARTICIPANT LIST

The following individuals attended one or more of the REI Focus Group meetings. Meetings were open to the public, so attendance varied from meeting to meeting, and some individuals who were present might not have signed the attendance lists.

CoChair: Tim Wagner, Sierra Club
CoChair: Ernie Wessman, utilities consultant and Air Quality Board

Abdinasin Abdulle
Steven Aderholt, Sound Geothermal
Rick Allis, Utah Geological Survey
Renette Anderson, DEQ Public Affairs
Mike Avant, Garkane Energy
Joe Andrade, Utah Science Center
Lane Ashton, Raser Technologies
Sara Baldwin, Utah Clean Energy
Des Barker, DBA, Inc.
Michele Beck, Utah Committee of Consumer Services
Vicki Bennett, Salt Lake City Environmental Program Manager.
Jason Berry, State Energy Program
Ted Boyer, Public Service Commission
Alyson Brennan, VP Political Advocacy UWABC
Gary Bryner, Brigham Young University
Jim Byrne
James Campbell, Utah Division of Air Quality
Patrick Clark, Staker Parsons
Caitlin Collins, Utah Association of Energy Users
Cathryn Collis, SWCA Environmental Consultants
David Curtiss, EGI University of Utah
Jamie Dalton, Utah Division of Public Utilities
Ron Daniels, State Energy Policy Coordinator
Kyle L. Davis, PacifiCorp/Rocky Mountain Power
Jennifer de Tapia, Student
Hans Ehrbar
Stephen Foerster, Student
Naomi Franklin, League of Women Voters
Jordan Gates, Salt Lake City
Rick Gilliam, Sun Edison
Steve Graham, Utah Community Reinvestment Corporation
Cheryl Heying, Utah Division of Air Quality
Keith Hill, Deseret Power
Jim Holtkamp, Holland and Hart

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Mavion Horna, MJH Power Consulting
Carol Hunter, Rocky Mountain Power
Andy Huttgren, Environmental Performance Group
Susan Innis, Western Resource Advocates
Tom Jepperson, Questar
Kelly Knutsen, Utah Clean Energy
Chris Lilley, Kennecott Utah Copper
Nykole Littleboy, Division of Air Quality
Sam Liu, Utah Division of Public Utilities
Tracey Livingston, Wasatch Wind
Alexander Lofft
Tim Loftis, Morgan Stanley
Douglas Maxfield, Roan Power
Al McKee, Bureau of Land Management
Geoff McNaughton, Division of Forestry , Fire and State Lands
Michael Mendelsohn, Western Resource Advocates
Cheryl Murray, Committee of Consumer Services
Dianne Nielson, Governor Huntsman's Energy Policy Advisor
John Njord, Utah Department of Transportation
Ann Ober, Salt Lake County
Dave Olive, Shoshone Energy
Russ Olsen, Kennecott Utah Copper
Randy Parker, Utah Farm Bureau
Leon Pexton, Utah Municipal Power Agency
Mike Peterson, Utah Rural Electric Association
Ben Phillips, Emery Energy
Artie Powell, Utah Division of Public Utilities
Phil Powlick, Stake Energy Program
Greg Probst, enXco
Pepper Provenzano
Ted Rampton, Utah Associated Municipal Power Systems
Kirt Rhoades, Geo Engineers
Lisa Romney, Chevron Energy
Brenda Salter, Utah Division Public Utilities
Andy Schoenberg, Utah Population and Environment Coalition
Richard Simon, V-Bar
Glade Sowards, Division of Air Quality
Rick Sprott, Department of Environmental Quality Executive Director
Brad Stevens, Utah Solar/Green Power
Jim Tarpey, Holland and Hart, LLP
Roger Tew, Utah Associated Municipal Power Systems
Mark Thomas, M. D. Thomas Consulting
Todd Turner
Kent Udell, University of Utah Mechanical Engineering
Kathy VanDame, Wasatch Clean Air Coalition
Christy White, RAAM Power

Becky Wilson, Utah Public Service Commission
Carol Withrow
Betsy Wolf, Salt Lake Community Action Program
Sarah Wright, Utah Clean Energy
Joni Zenger, Utah Division of Public Utilities
Marelynn Zipser, League of Women Voters
Renee Zollinger, Environmental Performance Group
~~CoChair: Tim Wagner, Sierra Club~~
~~CoChair: Ernie Wessman, utilities consultant and Air Quality Board~~

~~Naomi Franklin, League of Women Voters~~
~~Marelynn Zipser, League of Women Voters~~
~~Carol Withrow~~
~~Hans Ehrbar~~
~~Jason Berry, State Energy Program~~
~~Phil Powlick, Stake Energy Program~~
~~Ron Daniels, State Energy Policy Coordinator~~
~~Cathryn Collis, SWCA~~
~~Patrick Clark, Staker Parsons~~
~~Des Barker, DBA, Inc.~~
~~Mike Peterson, Utah Rural Electric Association~~
~~Sarah Wright, Utah Clean Energy~~
~~Kathy VanDame, Wasatch Clean Air Coalition~~
~~Cheryl Murray, Committee of Consumer Services~~
~~David Curtis, EGI University of Utah~~
~~Alyson Brennan, VP Political Advocacy UWABC~~
~~Steven Aderholt, Sound Geothermal~~
~~Jamie Dalton, Division of Public Utilities~~
~~Artie Powell, Division of Public Utilities~~
~~Mark Thomas, MD Thomas Consulting~~
~~Kent Udell, University of Utah Mechanical Engineering~~
~~Ted Boyer, PSC~~
~~Jim Holtkamp, Holland and Hart~~
~~Renee Zollinger, Environmental Performance Group~~
~~Brad Stevens, Utah Solar/Green Power~~
~~Kyle L. Davis, PacifiCorp/Rocky Mountain Power~~
~~Carol Hunter, Rocky Mountain Power~~
~~Ann Ober, Salt Lake County~~
~~Dianne Nielson, Governor Huntsman's Energy Policy Advisor~~
~~Rick Sprott, Department of Environmental Quality~~
~~Cheryl Heying, Division of Air Quality~~
~~James Campbell, Division of Air Quality~~
~~Glade Sowards, Division of Air Quality~~
~~Renette Anderson, DEQ Public Affairs~~
~~Gary Bryner, BYU~~
~~Jordan Gates, Salt Lake City~~

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~~Kirt Rhoades, Geo Engineers~~
~~Abdinasin Abdulle~~
~~Brenda Salter, Utah Public Utilities~~
~~Mike Avant, Garkane Energy~~
~~Caitlin Collins, UAE~~
~~Andy Huttgren, Environmental Performance Group~~
~~Kathy Van Dame, Wasatch Clean Air Coalition~~
~~Becky Wilson, Utah Public Service Commission~~
~~Ted Rampton, UAMPS~~
~~Christy White, RAAM Power~~
~~Sarah Baldwin, Utah Clean Energy~~
~~Keith Hill, Deseret Power~~
~~Steve Graham, UCRC~~
~~Cheryl Heying, Division of Air Quality~~
~~Glade Sowards, Division of Air Quality~~
~~James Campbell, Division of Air Quality~~
~~Dianne Nielson, Governor's Energy Advisor~~
~~Rick Sprott, Division of Environmental Quality Executive Director~~

APPENDIX 2: LIST OF PRESENTATION AND DISCUSSION TOPICS

In order to develop a shared understanding of renewable resources and the issues affecting their development, the REI group met several times in July and early August to hear presentations and discuss aspects of the following topics:

- The options identified by the Climate Change Stakeholder Working Group's Energy Supply Sector subgroup
- Utah's renewable energy landscape, presented by Philip Powlick of the State Energy program
- An overview of Renewable Portfolio standards, including an introduction to state experience and possible cost impacts, prepared for the CCSWG by Ryan Wiser of the Lawrence Berkeley National Labs
- Comparisons of Congressional global warming bills, prepared by Amy Royden-Bloom, National Association of Clean Air Agencies
- A discussion of the nature of an electrical "smart grid,": presented by James Campbell of UDAQ staff
- Review of renewable initiatives in various western states, presented by James Campbell
- Presentation on utility avoided costs, presented by Becky Wilson of the Utah PSC staff
- Presentation on barriers to solar energy development, presented by Sarah Wright of Utah Clean Energy
- Presentation of geothermal project development hurdles, by Richard Goff of PacifiCorp
- A case study of the Oregon Renewable Portfolio Standard and other supporting legislation, presented by Kyle Davis of PacifiCorp
- Discussion of questions to address when considering a renewable portfolio standard, presented by Kyle Davis of PacifiCorp

In addition, on September 20, the State Energy Program presented the results of an evaluation requested for the REI to determine the technical and economic potential for renewable resources in Utah.

Comment [Gms100]: Powlick

All of the above presentation handouts and other written materials will be available until -_____ on the REI Focus Group web site at http://www.deq.utah.gov/Issues/REIFG/index.htm, or available by contacting the Director of the Utah Division of Air Quality.

APPENDIX 3 – SUBGROUP DISCUSSION SUMMARIES

Definition of Renewables Subgroup

Cost Effectiveness Subgroup

A subgroup was formed to discuss the meaning of "cost effective" as it should be applied to the development of renewable energy resources. Utilities generally must show, either to the Utah Public Service Commission in the case of investor owned utilities, or to various government entities or boards in the case of public power agencies, that investments are prudent and have been made in the best interest of the utility's customers. Mr. Artie Powell of the Utah Division of Utilities presented some information on Least Cost/Least Risk as it applies to PacifiCorp's IRP planning process on August 15, 2007. His presentation is reproduced on the following pages of this appendix.

Comment [Gms101]: CCS: NOTE: The last statement about prudency is true, but relates more specifically to the rate making process. The cost effectiveness issue related more to the long term planning and resource procurement process. It would be useful to include a summary of that more pertinent topic in this section. Something that speaks to the fact that utilities plan their system to find a least cost/least risk expansion plan by examining numerous risk factors and how different resource portfolios perform under varying conditions.

[insert Artie Powell's presentation, or summarize the information he provided]

APPENDIX 4 – STAKEHOLDER AND PUBLIC COMMENTS AND INPUT TO THE REI FOCUS GROUP

1. REI Policy Recommendations Submitted by Sarah Wright, Utah Clean Energy:

Renewable Energy Policy Options for consideration by the Utah REI

1) **Renewable Energy Standard** – sometimes referred to as Renewable Portfolio Standard.
    - Could include multiplier or other mechanism to promote Utah Projects as part of the renewables developed under the standard.
    - Could include solar set-aside to drive solar PV and concentrating solar resources that provide peak power
    - Could support energy storage technologies – such as compressed air or other emerging technologies
    - Could include both an energy and capacity requirement which would help drive a diverse mix of renewables, including base-load renewables such as geothermal and energy storage

2) **Renewable Energy Development Fund** (I can pull together more information about this option) A Renewable Energy Development Fund is a policy measure designed to advance clean and renewable energy resources by providing sustainable funding mechanisms that accelerate the development of new clean energy technologies.
    - Could be funded through a systems benefit charge (similar to the energy efficiency tariff rider that RMP already has in place to their Demand Side Management programs
    - This is a good complimentary policy to a Renewable Energy Standard. A number of states implement both a Renewable Energy Development Fund and a Renewable Energy Standard

3) **Transmission Authority with Renewable Requirements -** In 2007, both Colorado and New Mexico passed Transmission bills with renewable energy requirements.
    - Colorado Transmission legislation - http://www.leg.state.co.us/clics/clics2007a/csl.nsf/fsbillcont3/4B1B8C4BA39953A287257251007D6838?open&file=100_enr.pdf
    - New Mexico Transmission Legislation - http://legis.state.nm.us/Sessions/07%20Regular/final/HB0188.pdf

4) **Net Metering**
Utah's current net metering bill could be modified to facilitate more distributed renewable energy and streamline the net metering process for customers. The following changes to the current bill should be considered:
- Increase the per-system kW cap (currently set at 25 kW) – Some states have recently increased their per-system net metering caps, such as Oregon (2 MW) and New Mexico (80 MW).
- Modify the true-up period so that customers can roll-over their kWhs to the next month rather than being paid at the avoided costs.
- Model net metering rules can be found online at www.irecusa.org.

The Utah Division of Public Utilities recently released a report on Net Metering with recommendations to further examine Utah's net metering statute: http://www.psc.state.ut.us/misc/06docs/0699903/NetMeteringReport.pdf

Comment [Gms102]: UCE: These comments were not written for inclusion in a formal report. Please do not include this version. I assume we will discuss this in our meeting

APPENDIX 5 – 17 QUESTIONS TO ADDRESS WHEN CONSIDERING AN RPS

Utah Renewable Energy Initiative August 2, 2007
Kyle L. Davis, PacifiCorp / Rocky Mountain Power
(503-813-6601) or kyle.l.davis@pacificorp.com
Excerpts from testimony offered by Brent E. Gale, Sr. Vice President, Regulation and Legislation, MidAmerican Energy Holdings Company to the Utah Legislature's Public Utilities and Technology (PUT) Interim Committee on June 20, 2007

Questions to address when considering a Renewable Portfolio Standard (RPS):

1. What is the purpose that the state wants to accomplish?

2. Is a mandate necessary or is it sufficient to set targets and remove statutory and regulatory impediments?

3. If a mandate is imposed, will it be reconciled with state standards regarding cost effectiveness?

4. How will consumers' interests be protected?

5. How should benefits and costs be passed on to customers and through what mechanism?

6. Will RPS targets be based on nameplate capacity or retail sales?

7. What ultimate percentage of renewable energy should be achieved by what date, and what, if any, interim benchmark goals should be established?

8. Should the details be developed in legislation or delegated to a regulatory agency?

9. Which resources qualify as "renewable energy" and what limitations, if any, will be placed on the use of these resources for compliance?

10. Through what means can an electric utility comply with an RPS; e.g., ownership of renewable generation, purchase of renewable energy, purchase of renewable energy credits (RECs), alternative compliance payments (ACPs), penalties in lieu of compliance?

11. What restrictions would be placed on an electric provider's ability to use RECs to comply with an RPS?

12. With regard to facility vintage, which generating facilities count toward compliance with the RPS?

13. With regard to geographic eligibility, will limitations be established for use of qualifying generation and RECs for compliance?

14. Would the same RPS requirements apply equally to all retail electric providers, or would requirements vary based on a provider's market share?

15. Under what circumstances will a utility be granted an exemption from compliance with RPS requirements?

16. Should there be penalties for an electric provider's failure to comply with RPS?

17. What considerations should be given to the establishment of a State RPS to provide for maximum compatibility with a prospective Federal RPS?

Specific RPS Design Elements that Will Affect Compliance Costs:
– Percentage targets and timeframes
– Resource eligibility
– Geographic eligibility and delivery requirements
– Set asides for solar or other resource types
– Flexible compliance mechanisms (RECs, banking, borrowing, settlement periods)
– Encouragement for long-term contracting

Resource/Project "Cost Effectiveness" Cost Cap Mechanisms in Use in Other RPS States:
– **Codification of Risk-Adjusted, Least-Cost Standard**
  • Oregon
– **Bundled Contract Price Caps**
  • New Mexico, Hawaii, Montana
– **Alternative Compliance Payments** *(freely available)*
  • Massachusetts, New Jersey, Rhode Island
– **Alternative Compliance Payments** *(available/recoverable in rates if least cost measure and/or insufficient available renewable energy)*
  • Delaware, District of Columbia, Maryland, Oregon

Overall RPS Program Compliance Cost Cap Mechanisms in Use in Other RPS States
– **Retail Rate/Revenue Cost Cap**
  • Colorado, New Mexico, Oregon, Washington
– **Financial Penalty** *(for competitive suppliers, will act as cost cap)*
  • Connecticut, Texas, Oregon, Pennsylvania
– Customer-Class Bill Impact
  • New Mexico, Maryland, Delaware, Maine
– **Renewable Energy Fund Limitation**
  • Arizona, California, New York
– Force Majeure Clauses

- Pennsylvania, Minnesota, Nevada, Maine, Oregon, etc.

OREGON RPS CASE STUDY

The following pages contain the case study of the Oregon RPS and related legislation was presented to the REI Focus Group, and used by that group as an efficient way to understand and consider the various design features that could possibly be useful in a Utah RPS. The case study was prepared by Kyle Davis of PacifiCorp, part of Mid American Energy Holdings Company.

[insert the pdf version of the case study]

APPENDIX 6 – TAX CREDITS AND INCENTIVES

The REI Focus Group reviewed the following tax credits and incentives that have been enacted at the Federal level, or used in one or more Western states:

Current Incentives for Renewable Electricity

Federal Incentives

1. Renewable Energy Production Tax Credit: 1.9 cent/kWh tax credit for electricity generated by wind, solar, closed-loop biomass, and geothermal resources. Cannot be used with the Solar and Geothermal Business Tax Credit and sunsets December 31, 2008.

2. Solar and Geothermal Business Tax Credit: 10% for geothermal and 30% for solar for commercial or industrial facilities using solar or geothermal technologies.

3. Farm Bill Grant, Section 9006: For energy efficiency and renewable energy projects by agricultural producers and small businesses in rural areas – not historically utilized in Utah – only one previous award. applicant cost share may be a deterrent, capped at $500,000.

4. Residential Solar and Fuel Cell Tax Credit: 30% up to $2,000 for solar electric. Sunsets December 31, 2007.

5. Modified Accelerated Cost-Recovery System (MACRS): Businesses can recover investments in certain property through depreciation deductions.

6. Clean Renewable Energy Bonds (CREBs) [2007 awards have been made, but congress has not yet passed funding beyond this FY]: financing mechanism for public sector renewable energy projects 0% interest rate, the borrower pays back only the principal of the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest.

State Incentives - Utah

1. Renewable Energy Systems Tax Credit: State tax credit for residential (25% up to $2,000) and commercial (10% up to $50,000 or PTC for wind, biomass and geothermal over 600kW of 0.35 cents/kWh during first 4 years for systems from 2007 forward) renewable energy systems. PTC cannot be used in conjunction with the investment credit.

2. Renewable Energy Sales and Use Tax Exemption: State sales tax exemptions for the purchase or lease of equipment used to generate electricity by a renewable energy production facility with generation capacity of 20kW or greater. Sunsets June 30, 2009.

3. Net Metering Program: requires all electric utilities and cooperatives (municipal utilities are excluded) to allow customers to connect renewable energy systems to the grid for their own use and to supply excess electricity to the electric grid. The utility will "net"

the customer's electricity use and production over the monthly billing period, in essence, paying the customer retail price for the electricity they produce. If net metering results in excess customer-generated electricity over the billing period, the utility will credit the customer for the electricity at the avoided cost rate – i.e., the cost the utility would otherwise incur to generate power if it did not purchase electricity from another source. System size capped at 25 kW.

4. Solar Easements: Rights to sunlight access attached to property rights

Other Incentives for Renewable Electricity (from neighboring and other states)
Listed on www.dsireusa.org

1.*Solar Rebate/Buydown Programs (examples of participating states: WY- 50% up to $3,000, CO – many - Rebates for grid-tied PV systems are offered at $2.00 per watt, up to $6,000, AZ – many, OR – buydown – Res:$2.00/W-DC to $2.25/W-DC- $10,000 cap, Com: $1.50/W-DC to $1/W DC- $57,000-$70,000 cap, FL - Res - $20,000/ Com- $100,000, very common idea often funded by a Public Benefit Fund: see #12)

**This is something that PacifiCorp is currently testing out, beginning this year, in a small pilot project of 107 kW/year at $2/watt.*

2. Tax credit/deduction increases (examples of participating states: ID – deduction - 40% up to $5,000/year, $20,000 total, OR – credit -Very aggressive business energy tax credit –35% up to $10,000,000 over 5 years, 50% for RE generating facilities, $9,000 for single family homes – Residential credit caps at $6,000)

3. Green Tag Purchase

Example: The Northwest Solar Cooperative (NWSC) offers to purchase the rights to the environmental attributes or “Green Tags” derived from grid-connected solar PV- or wind-generated electricity at a rate of $0.05/kWh through December 31, 2009 (examples of participating states: ID, OR, NV- portfolio energy credit trading program)

4. Low or Zero Interest Loans (examples of participating states: ID - Res: $15,000, Com: $100,000, 4% interest, 5 years, generating projects not eligible, 0% interest for heat pump, OR - Small scale RE loans - Typically $20,000 - $20 million)

5. Grants (example of participating states: OR - RE grants: large scale, generating projects preferred, ID - RE grants: large scale, generating projects preferred)
Solar for Schools (examples of participating states: OR, ID)

6. Bond program (examples of participating states: ID, NM - Projects financed with the bonds will be paid back to the bonding authority using the savings on energy bills, state government and school district buildings)

7. Property Tax Exemptions (examples of participating states: CO, AZ)

8. PV leasing Program for PV water pumps (example of participating state: TX)

9. Building Permit Fee Credit (Exemption) for Solar (example of participating state: AZ – up to $1,000)

10. Mandatory Utility Green Power Option **-** All electric utilities are required to offer green power options to their customers (examples of participating states: CO, NM, MT, WA).

11. Permitting Standards

12. Public Benefit Funds/Trusts

13. Renewable Energy Zones –developed to instigate siting and construction of transmission to facilitate electric output from renewable energy technologies (example – TX – Competitive Renewable Energy Zones (CREZs).

APPENDIX 7 – WYOMING INFRASTRUCTURE AUTHORITY

The WIA is set up as a state instrumentality; in a way that the state is not pledging full faith and credit on bonds issued by the authority a necessary condition to address Wyoming constitutional issues. Even with that limitation, the WIA scope is very broad, with essentially cradle to grave authority to build and strengthen the transmission system, inside or outside the state. WIA can partner with the private sector, and has bonding capability up to $1 billion on projects it doesn't own, and unlimited for projects owned by WIA.

The WIA has found that its most effective role is that of facilitator to help get the right players to the table, to serve as a catalyst/coordinator, advocate, or project sponsor. Much of its budget is used to fund feasibility studies that will help participants decide whether to build a transmission line. The WIA works with project partners to complete the studies. If the parties decide to proceed, the intent is to recover the Authority's costs so that the money can be re-used. Major partners would take the major lead going forward. Major projects facilitated by WCI include the Wyoming-Colorado Intertie Project, the Trans West Express, the Frontier Project, and the IGCC Pilot Project.

Some of the challenges that the WIA faces include the need to engage many different stakeholders with very different agendas; engineering challenges including technology, terminal locations, suitable corridors, and the impact on the rest of the grid; environmental and permitting issues; financing; the breadth and depth that should be included in the feasibility studies; equity financing during the development stage; and risk allocation and certainty of the revenue stream during the construction stage.

Public policy challenges include the use of a regional approach to transmission planning and development rather than individual states doing their transmission planning independent of other states or regional needs, the coordination of state and federal regulatory commissions, and coordinating for site approval processes.

Also, there are challenges concerning the application of open meetings laws and the Public Records Act, and the impact those requirements have on the willingness of participants to share confidential, proprietary or market-sensitive information.

The WIA is not required to comply with the Wyoming State procurement policy processes.

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Public Comments

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Renewable Energy Initiative – Experience and Recommendations from residential customer with a grid-tied solar system

Submitted by Andy Schoenberg. 801 274 7423 wfaut@comcast.net

Background

Our home has a 1400-watt, grid-tied solar photo-voltaic (PV) system, including a battery bank, which has been operational since the summer of 2006. This system also has provision for connecting several solar powered commuter vehicles whose batteries can be charged from the home PV system as well as providing some PV power to the home when the vehicles are fully charged. (See Appendix) The experience gained in installing, getting permits and tax credits, dealing with Rocky Mountain Power and operating this system should be of value in considering initiatives which would promote renewable energy, and PV systems in particular.

The system cost was $7861 not counting labor since I installed the system myself. **Federal and State tax credits reduced this cost by $2000 and $1903 respectively**. It should be noted that the State does not give credit for battery backup systems, which accounts for a slightly lower state tax credit. With these tax credits, the net equipment and supply costs for our solar system amounted to $3958**. This month Rocky Mountain Power (RMP) announced its incentive program of $2000 per kW of solar generated AC power. This would have reduced our hardware cost to $1958.**

We do not have exact figures about how much energy our system generates. Review of our monthly statements from RMP, indicates that we have reduced our usage of energy by 6 kW hr per day or 180 kW hr per month. Our home solar system supplies approximately half of our power needs during the spring and fall when the furnace motor and the air conditioner are not running**. Assuming a value of $0.10 per kW-hr for clean PV power (we pay that rate for the blue sky program) the annual savings is $216 or 11% of the net "capital" cost of $1958.** Thus a PV system installed this year would give a reasonable return on investment even if we discounted many other good reasons to install a PV system.

Some of these other good reasons to go solar are enumerated here. (1) If home solar systems become popular, the increased resale value of the home may recapture most of the investment. (2) **Home electric solar systems enhance independence and security**. This was illustrated last year when power in our neighborhood was interrupted for 2 days due to a severe windstorm. We were able to run our refrigerator, stove and several lights from our solar system and the energy stored in our battery bank. (3) There is great satisfaction in knowing that we are reducing the pollution and global warming associated with fossil fuel generated electricity. The esteem and satisfaction factor should not be discounted, given that people are willing to spend $10,000 to $50,000 to remodel their kitchens, bathrooms and bedrooms. (4) Since the energy from the sun is essentially free, the cost of an installed solar system will not escalate in contrast to the inevitable increased cost of electricity based on coal and gas fired power plants. (5) Our increased awareness and understanding of electric power and energy cost leads to many other efforts to reduce energy usage. (6) **Owning your own power generating system makes**

each of us a stockholder in the electric "power grid" and less dependent on "remote" owners to supply our essential needs for energy.

Given these great incentives and advantages to home solar electric systems why don't we have a massive demand for PV systems in Utah?

Obstacles and Needs for Wider Use of Grid-tied home PV systems.

1. Lack of PV Vendors and Installers

Learning about solar power systems was a multi-year process for me as a home owner. The Internet, and "Home Power" magazine were the main sources. There are no real "stores" for grid-tied solar PV systems in Salt Lake City. The Solar Power Company (see Yellow Pages) is a one-man operation specializing in remote cabin solar installations. Although very helpful and knowledgeable, the owner is not licensed to install grid-tied solar systems and is often out of town installing cabin systems. The other vendors listed under "Solar Power" in the phone book typically are not there to answer your questions, and require that you leave a message.

I ordered the components of my system and installed them myself. I had a very difficult time finding a licensed electrical contractor willing or able to inspect my installation. Most major contractors turned me down saying they had no experience and did not know the NFPA codes for solar PV systems. The few that had experience were too busy to even come out to give me an estimate for changes that may be needed. Finally one of them suggested that I get the county inspector to come out and tell me what did not meet code or needed fixing. He came in a few days and to my surprise, approved the system without corrections. I had probably over designed my system with lots of circuit breakers at various junctions.

I believe that the lack of vendors, installers and people with knowledge of solar PV systems is the great barrier to more solar PV power in Utah.

2. Cost issues

Our own experience of costs given the rebates and recent incentives contradicts the public's perception that PV systems are too expensive. The federal, state and RMP incentives, rebates and or tax credits will likely reduce the cost of a residential system by more than 50%. Pending legislation in Congress will likely lift the cap of $2000 tax credit, further increasing the advantage of renewable energy generation. The history of dramatic cost reductions in silicon based solar panels indicates that the current price of $4 to $5 per watt for solar panels will likely decrease by half in the next 5 to 10 years. I am submitting 9 copies of a book, "Exponential Solar", (See www.exponentialsolar.com) which presents the evidence of how solar PV will transform the electric power generation system. It also includes the estimates of electric power needed for the future fleet of plug-in hybrid and EV vehicles.

3. Regulations, Codes and Permit Issues and Approvals

Getting a permit to install the system from the Salt Lake County involved providing a detailed electrical diagram of the system as well as a drawing of the house and placement of the solar panels on the property. A potentially serious obstacle for approval was the placement of the solar panel array at ground level, which in our case needed to be fairly close to the southern property line. There is some question whether a tilt-frame with

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solar panels meets the definition of accessory building or structure and which set back regulations apply. The set back can be 1, 3, 10, 20 or 25 feet depending on interpretations of the regulation. After some debate with the regulators, who were helpful and reasonable, we managed to get approval for the placement of the solar panels. The permit for the electrical modification to our house was $70.

One of our early solar arrays was placed on our garage roof. The current regulation of a maximum height of a non-attached garage of 16 feet is difficult to meet if the gable runs north to south and the array needs to face south at 45 degrees from horizontal. The code needs to be modified for roof-mounted solar systems, which may not be flush with the shingles. **Both the setback and the maximum height issue of solar panels needs to be clarified and harmonized statewide.**

After approval of the county inspector, we were able to apply for the State and Federal tax credit. This involved filling out considerable paperwork and providing receipts of the purchased items for the solar power system. This took a week or two of time and some clarification of cost items. **It may be noted that the cost of battery backup for the grid-tied system was not included in the State's tax credit. That provision of the law should be modified**, since the battery backup system supplies needed electricity when the grid is disabled due to natural disasters or other shutdowns of the grid.

4. **Net Metering and reimbursement Issues**

Rocky Mountain Power (RMP) required us to sign a contract for net metering which was mailed to us without much hassle. After signing the contract, the new LCD remote-sense net-metering power meter was installed by RMP without cost. This meter has two alternating readings with the first showing the kW-hrs supplied by RMP, the second the kW-hrs our solar system supplied to RMP. After a year the first meter failed. RMP installed a new meter within a few days and it has been functioning well since then. We discovered that the current regulations allow **RMP to pay us only $0.043 per kW-hr if during any month we generate more energy than we use.** In most states the lower rate applies only if the net energy supplied to the power company during the whole year is greater than that supplied to the customer. **This net-metering regulation in Utah should be changed accordingly**. Furthermore, since PV power is clean power, is generated during highest load periods, and avoids the power losses associated with multiple transformers and long transmission lines, the power supplied by **PV solar systems should be reimbursed at a premium rate of up to $0.15 per kW-hr.**

5. **Maintenance issues**

Our system has functioned reasonably well both in summer and winter. In the winter, snow removal after a storm is required to restore power generation**. For this reason we recommend that PV panels be installed where they can be easily cleaned.** Ground level installations are preferable. The capability of tilting the panels to horizontal in the summer and to a steep 50 degrees to the south in winter has helped with the efficiency and also the snow removal. The four panels that are installed on top of the garage are less efficient in the winter since mechanical snow removal is hazardous, and melting of the snow by the sun is slow especially during prolonged freezing temperatures.
Our battery backup system requires periodic maintenance by adding distilled water to the batteries as needed.

Conclusions

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1. **Residential Solar PV systems are very cost effective with the current and proposed rebates and tax credits. The cost is likely to decrease by more than 50% in the next 5 to 10 years. Generation of clean PV energy should be reimbursed at a premium rate of $0.10 to $0.15 per kW-hr.**
2. **A great need as well as opportunity exist in the state to expand vendors and installers of grid-tied solar systems. Several "stores" with displays of solar power systems are needed in the Salt Lake Valley.**
3. **Regulations should be clarified and harmonized statewide to simplify public and vendor education and promote adoption of residential PV installations.**

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From: "Olive, David" <dolive@nwbshoshone-nsn.gov>
To: <jacampbell@utah.gov>
Date: 9/25/2007 9:58 AM
Subject: General Comments

James,

General comments regarding RPS and renewable development in Utah:

· Rate recovery should be available to utility for renewable energy contracts

· Mandatory compliance to RPS goals, not just Alternative Compliance Payments

· Establish 2-year incremental objectives to meet overall requirement

· Mandatory annual renewable energy RFPs administered by independent third-party

o Third-party fee paid by utility

o Utility and independent third-party cannot have ongoing business relationship

o Two-year moratorium on business between utility and independent third-party after conclusion of current RFP engagement

· Percentage requirement carve out for each renewable technology type i.e. 5% solar, 20% geothermal, etc.

· Renewable energy projects should be evaluated on best fit, not just energy and cost

· Cost of combustion turbines or other thermal resource (and associated fuel and O&M) and market purchases to backstop intermittent resources such as wind and solar should be included in evaluation

· Fuel, carbon tax, and capital costs displaced by renewable energy projects should be netted against renewable energy project costs

· Avoided cost estimates should be expanded to include IGCC

· Net metering for small renewable energy projects

Thank,

Dave Olive
Shoshone Energy

Renewable Energy Mandates or Market Incentives?

As Americans, we are eager to diversify our energy portfolio by integrating wind, sun, geothermal and bio-mass into our energy mix recognizing the environmental benefits. The Renewable Energy Initiative (REI) Focus Group, at the request of the BRAC, has spent numerous hours discussing and listening to presentations related to renewables. As with the climate change options presented by BRAC, there has been no economic analysis of the costs and benefits of a REI and economic impact to rate payers and Utah's businesses.

The philosophical debate currently centers on the role of government. Should there be a policy mandate to achieve a 10%, 20% or more level of renewable energy or should the government provide adequate time, a positive business environment and incentives? According to Richard Walji, president of Pacific Corp (Rocky Mountain Power parent company) population growth in Utah will require an additional 3,500 megawatts of electricity by 2016. Renewable technology is decades away from handling more than a small part of our energy needs and ultimately, being cost effective.

Renewables currently make up a very modest part of the U.S. electric generation portfolio. Renewables, excluding hydro, provide slightly less than three percent of the nation's energy needs. Of that, wind makes up around 90 percent of the electricity attributed to state renewable mandates. Would a Utah renewable mandate therefore be a wind mandate benefiting a specific industry sector?

Utah, the United States Congress and numerous other states are currently debating the wisdom of joining 23 others states and the District of Columbia in mandating a percentage of our electricity from renewable resources. As we approach this debate something the Emperor Marcus Aurelius (AD 121-180) said has merit. "The object of life is not to be on the side of the majority, but to escape finding oneself in the ranks of the insane," he observed.

Virtually every state to date that has implemented a renewable portfolio mandate has had relatively high retail electricity rates and a high potential for developing renewable energy. According to the Energy Information Administration, states with renewable portfolio standards in 2005 paid an average of 42 percent higher electric rates.

Utah's Renewable Energy Initiative (REI) Focus Group is currently locked in a philosophical debate. Do we join 23 other states in mandating ten percent, twenty percent or even higher renewable portfolios or do we ask state government and policymakers to provide a favorable business climate and incentives to foster a market response?

Our natural resources allow Utahns to enjoy some of the nation's lowest power rates. Any of the renewable options currently under consideration will be at a higher cost to rate payers. Our state is enjoying an economic surge. Business is attracted by a set of tangible and intangible assets. Quality of life and aesthetics in Utah are complemented by the seventh lowest power rates in the nation, powered by Utah's abundant coal and natural gas.

Technology for capturing renewable energy, for the most part, is currently very expensive. While we recognize the need to broaden our energy portfolio, it must be cost effective. With the abundance of coal and other carbon based energy sources in Utah, incentives promoting clean coal technology seem to make sense.

Some argue that coal is a limited resource that is becoming more dangerous and difficult to harvest. Utah has an abundant supply of low sulfur, clean burning coal in the Kiaparowits Plateau which was placed off limits by the stroke of President Bill Clinton's pen without input from Utahns or Congress. Rather than mining 2,000 feet below the surface, Utah coal could be harvested more safely 500-600 feet underground.

As Utah scientists and economists have looked at potential for renewable energy development, a number of issues surface.

Solar is Utah's highest potential renewable opportunity, based on National Renewable Energy Laboratory (NREL) estimates, ranking us in the top five or six states. The technology exists to convert sun to energy, but it is extremely expensive. Utah has good potential for geothermal but drilling a well to harvest thermal energy can cost over $1 million with no guarantee of success. Today, technology for capturing energy from wind is the most proven and cost effective, with a number of specific sites in Utah holding promise. NREL ranks Utah near the bottom in biomass opportunities.

Wind and solar energy capture are intermittent. A state renewable energy mandate will not only impact costs, it could jeopardize the economic viability of our current providers as well. Renewables can only contribute to the overall energy supply but do little to help power providers meet peak demand. Not many of us are willing to have electricity when the sun shines or the wind blows. A recent integration study for Utah estimating incorporating a10-percent intermittent power supply increases the cost of the renewable power over its production cost by 4.5 to 5-cents per kilowatt hour.

Utah's geography and government land ownership (65% federal) provides a unique set of problems. The most cost effective harvest of solar energy is on flat landscapes requiring five-acres per of photovoltaic cells per megawatt. Utah's wind harvest opportunities are spread across the state, most far from transmission lines, and must compete with Wyoming Wind who arguably has some of the nation's most productive wind farms.

Integrating renewable power requires transmission lines that cost at least $250,000 or more per mile depending on geography. Constraints include distance, terrain, national parks, recreational areas, wilderness areas, National Forest Service and Bureau of Land Management land use plans, endangered species habitat and road access to build and maintain power lines.

Then of course there is the not-in-my-backyard (NIMBY) issue. This sentiment makes it hard to site renewable energy facilities. Some of the landowners in Wyoming who contracted to install wind turbines are having second thoughts when they see their historic wide-open views impacted. Probably the most notorious NIMBY comes from the Commonwealth of Massachusetts. A 420 megawatt wind farm proposal in Cape Code Bay has been awaiting approval for six years. Will politics ultimately determine the value and outcome of a REI? It's interesting to note, United States Senate champion of environmental causes Massachusetts Senior Senator Ted Kennedy makes his home near the Bay.

As the debate continues on what Utah's role in reducing global greenhouse gases will be, it is important to consider the higher energy costs associated with a renewable portfolio mandate. How much will our citizens and economy have to pay?

Utah Farm Bureau Federation

Dear Mr. Campbell:

I offer a graduate course at the University of Utah this semester on Energy and the City. Students and I have been following the deliberations of the REI Focus Group and want now to submit the attached revisions to the REI Draft Report. We also submit the following statement for consideration as we are convinced that it presents initiatives that would be in the long-term interests of all parties concerned.

Whereas the REI Focus Group has advance a Renewable Portfolio Standard (RPS) for investor-owned utilities in Utah that is based on an Oregon case study, and

Whereas Utah is projected to grow at a rate that exceeds Oregon's projected growth by 30 percent, and

Whereas projected energy production in Utah is expected to grow at a rate that exceeds RPS growth in renewable generation capacity with corresponding increases greenhouse gas emissions, and

Whereas the proposed RPS does not currently encourage demand-side management, dispersed-site production or improved plant efficiencies,

We request that the REI Results report to be modified to include the following three propositions:

1) That up to 30% of each year's RPS target may be met with any or all of the following:

a) Demonstrable results from demand-side management programs

b) Verified improvements in utility plant efficiency

c) On-site renewable energy installations in homes and small businesses

2) That the RPS targets be increased by 30 percent from 20% to 26% renewables by 2020

3) That, at a minimum, Renewable Portfolio Standards should change through time so as to guarantee a 26% reduction in greenhouse gas emissions by 2020 over current levels.

Sincerely,

Dr. Philip C. Emmi

Professor of Urban & Regional Planning

College of Architecture + Planning

University of Utah

375 S 1530 East RM 235 AAC

Salt Lake City, UT 84112-0370

(801) 581-4255 (801) 916-0342 cell

emmi@arch.utah.edu

www.arch.utah.edu

DRAFT

To: Renewable Energy Initiative (REI) Focus Group
c/o James Campbell
Jacampbell@utah.gov

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From: Salt Lake County Mayor Corroon

Re: Net Metering Issues for REI Focus Group

Dear Focus Group Members:

Salt Lake County is interested in diversifying the energy portfolio of the Salt Lake Valley, both internally for our government infrastructure and externally for our constituents. Given the committees focus on "actions that could encourage the transmission and distribution system to be strengthened to support renewable resources," I am submitting this letter for your consideration to encourage amendments to Utah's Interconnection and Net Metering policies and procedures. In 2006, Salt Lake County installed its first solar photovoltaic (PV) system as a part of the Salt Palace Expansion project. Since that time, we continue to look for new opportunities to further promote environmentally and socially responsible energy resources.

In light of the upcoming REI report, I write to discuss two Salt Lake County renewable energy projects and the barriers currently impeding their successful implementation. First, Salt Lake County is interested in partnering with local financial institutions to install $12 million worth of solar PV systems on our County facilities. Our initial discussions have been promising. Local governments across the United States have successfully installed these types of systems using similar business plans.

The second project we are considering is a major Concentrating Solar Power (CSP) installation as part of the "Solar Salt Lake Project", a partnership with Rocky Mountain Power, Utah Clean Energy, Kennecott Land, the State of Utah and Salt Lake City.

Although we are in the early stages for both of these projects, we have identified some significant barriers, in the context of net metering and interconnection, to the development of small-scale and large-scale distributed renewable energy. Please accept the following issues for consideration:

1) The current project size cap for net metered systems is 25 kW, which is relatively small compared to an average commercial load in Utah. If a commercial facility installs a solar PV (or other renewable energy) system larger than 25 kW, the process becomes significantly more challenging, time-consuming, and financially cumbersome. Our neighboring state, New Mexico, currently allows 80 Megawatts net metering.

2) Our efforts to obtain information on net metering and interconnection have been onerous and somewhat confusing, due to seemingly obscure program administration

policies and procedures. The information on these matters is not readily available, transparent, or straightforward to the general public.

3) The current net metering rule payment structure is not favorable for commercial rate schedules, as the net metering rule only compensates for the kWh charge, not other charges, such as the "demand charge." This does not accurately reflect the peak demand value of Utah's solar resource and creates a significant disincentive for large-scale commercial projects. We would recommend that net metering compensate for the demand charge in addition to the normal kWh charge.

I appreciate that Rocky Mountain Power and Questar have already taken strides to allow for distributed renewable energy; however, we are eager to explore ways to eliminate unnecessary barriers to adoption and encourage increased development of renewable energy resources. We look forward to working with you on this process.

Regards,

Peter M. Corroon
Mayor, Salt Lake County

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Page 6: [1] Comment [Gms13] | **Gladesowards** | **9/25/2007 6:41:00 PM**

UREA: I suggest placing a period at the end of emissions and deleting the words "*a major greenhouse gas contributing to climate change*." The group was tasked with exploring renewable resources, not debating the cause of climate change; recommend deltion

Page 6: [2] Comment [Gms14] | **Gladesowards** | **9/25/2007 6:41:00 PM**

UCE:

•Diversify Utah's electric generation resource portfolio, which is currently fueled predominantly by coal and natural gas. Renewable energy resources are fixed-price resources that help mitigate the impact of future increases and volatility of fossil fuel prices.

- Renewable energy resources help improve energy independence and security.
- Renewable energy resources do not emit CO_2 emissions, a major greenhouse gas contributing to climate change, and are not subject to future carbon regulation, thereby reducing the risk to Utah's consumers.
- Improve air quality by avoiding fossil-fired power plant emissions.
- Provide rural economic development opportunities, including the direct economic benefits associated with development of a new renewable energy projects in rural communities, as well as the direct benefit to the renewables energy industry, and the indirect benefits associated with Utah having a high quality environment, stable electric prices, and plentiful electric resources.

Page 6: [3] Comment [Gms15] | **Gladesowards** | **9/25/2007 6:41:00 PM**

CCS: NOTE: The rural economic development should be carefully considered, because if a large percentage of renewables is required it will likely raise energy prices significantly enough to have a countervailing negative impact on rural development. Additional studies are necessary to show the true economic impacts that would occur.

Page 6: [4] Comment [Gms17] | **Gladesowards** | **9/25/2007 6:48:00 PM**

Emmi: Add:

- Current methods of analyzing electric utility investment options do not yet incorporate the financial risk of likely greenhouse gas regulations. Should they do so, the historic advantage of fossil fuel generation options would diminish relative to renewable resource development.
- Bernstein Research estimates that utility companies with high-carbon fuel mixes that have not prepared for future costs of carbon emissions could see losses in earnings before interest, taxes, depreciation and amortization (EBITDA) while more prepared companies with low-carbon fuel mixes could see gains in EBITDA. Were methods of analyzing Utah's utility investment options to include the increased financial risk of climate change, renewable resource development would appear more attractive than it currently does.
- Due in part to the historical prominence of coal in Utah, the state has not yet cultivated a culture of renewable resource development with complementary institutional, regulatory and technological practices. As a consequence, it sees

great risks in the deployment of renewable resource technologies where others have establish records of practical accomplishment.

Page 6: [5] Comment [Gms20] Gladesowards 9/25/2007 6:41:00 PM

DPU: Note that the Division strawman comments also discuss this issue. Currently, under the regulatory guidelines established for the IRP process, all known resources are evaluated on a comparable basis; The process should result in the selection of those resources that provide optimal outcomes given the constraints of costs, risk, and uncertainty.

Page 6: [6] Comment [Gms22] Gladesowards 9/25/2007 6:41:00 PM

UAE: Also, if regulators are going to expand the discussion of externalities that discussion should include the external benefits as well as the costs.

Page 7: [7] Comment [Gms27] Gladesowards 9/25/2007 6:41:00 PM

UCE:

- Traditional electric utility cost analysis methods often evaluate renewable resources as being higher cost (with the exception of some wind and geothermal resources) and as compared to traditional electricity generation technologies. This is due to the low generating capacity factors of some renewable resources, increased development risks of geothermal field exploration, and limited technological/market maturity of some technologies.
- Traditional electric utility cost analysis models do not take into consideration external costs, such as impacts on air quality, public health, water consumption, effects of emitting greenhouse gases, and land use impacts, among others. Furthermore the risk mitigation benefits of renewables are difficult to quantify using traditional utility cost analyses.
- Renewable energy resources have high upfront capital costs and no fuel costs, making project financing more difficult.
- There are many misconceptions about renewable energy; for example, renewable resources are intermittent and it is a common misconception that renewables require 100% back up generation. The electric grid is designed to have more generation sources than are needed at any one time because no power plant is 100% reliable. It is also designed to absorb many fluctuations, such as unexpected outages and energy intensive operations. The grid matches electricity generation to electricity use, and renewable energy's variability is just one more variable in the mix.[1]

New transmission is necessary for many renewable energy developments. Transmission lines and associated electrical infrastructure are costly to build and usually take many years to design, obtain rights of way and permits, and construct. (This particular barrier does not apply to distributed renewable energy resources).

Page 7: [8] Comment [Gms30] Gladesowards 9/25/2007 6:41:00 PM

UREA: Perhaps it should be noted that there is no question about who pays for the costs of any expense at a rural electric cooperative – the members (ratepayers) of the co-op. Unfortunately the group has not had ample time to address costs and develop procedures to minimize the impact on power bills to Utah citizens while ensuring benefits are quantified and measured against the costs.